

AMENDMENTS

Please amend the Specification as follows:

On page 1, lines 10-11, please amend the first paragraph after the title as follows:

“This application claims priority from United States Provisional Application 60/488,909, filed on July 21, 2003 and International Application PCT/US2004/023483, filed 21 July 2004, from which this application is the national phase application.”

REMARKS

Specification Amendments

The insertion of this Cross Reference to Related Applications at page 1, line 11 for correct indication of the priority chain is believe proper and should be entered. It is important that the claim to priority is correctly indicated. Applicants respectfully request that this amendment be entered.

Priority Claim

Applicants believe that they are entitled to the claim for priority from both United States Provisional Application 60/488,909, filed on July 21, 2003, and International Application PCT/US2004/023483, filed 21 July 2004, for the amended claims submitted 23 May 2005. With regard to the Examiner's remarks in the above-mentioned Report, the limitation in the claims that the nanoparticles be in “colloidal solution” is supported by the US Provisional Application 60/488,909 by the following: (a) the particle size stated on page 1, lines 11-16, of from 1 to 15 nanometers would produce a colloid; at lines 11-13 it states that this invention deals with nano-scale surfaces (and on page 2, lines 15-16, and Fig. 1 illustrates 1 to 100 nanometers) that nano-particles in the range of 1 to 10,000 nanometers were intended, which will form colloids; (b) the change in color of the solution upon gold being in solution at page 5, lines 7-12, both indicate that a colloid was intended by the teaching

to be prepared and formed. When the dendrimer was added to the gold solution, the color changed again, page 5, lines 13-19, to indicate the formation of a new nano-particle of gold with the dendrimer. The Applicants believe that one of ordinary skill in the dendrimer and colloid art would understand that a nano-particle formed as a colloid in solution.

With regard to the Examiner's contention of support for the dendrimers with "phosphine and phosphine oxide" the terms on page 2, line 29 for "containing phosphorous atoms" and at page 2, line 5 for "phosphine-terminated alkyl hydrocarbons" imply that such compounds were believed to be equivalent for mercaptans. Thus all the amended claims from 23 May 2005 are believed supported by the earliest priority document.

The MRI use by its very nature requires a magnetic or paramagnetic metal ion be present as provided on page 3, line 21 of the Provisional Application. Thus the present use of iron in Claim 33 of the 23 May 2005 amendment is well within the knowledge of one skilled in the art from the disclosure of the US Provisional Application. The use of a gene gun is acknowledged as supported by the US Provisional at page 4, line 8. The use of heavy metals is a requirement for a gene gun to be effective and gold for that purpose is well known. Thus the use of the present gold nanoparticles with a dendrimer is believed supported as in Claim 34 of the 23 May 2005 amended claims.

Thus Applicants believe that the amended claims from 23 May 2005 are fully supported by the priority documents and respectfully request that the claims to priority be honored and instated.

Cited References

The main cited reference - **Peng** (US 2004/0101976, published May 27, 2004, filed May 13, 2002; based on US Provisional 60/290,541, filed May 14, 2001) - would be removed as a published reference if Applicants' priority date of 21 July 2003 is maintained. Although **Peng** is filed for priority prior to Applicants' earliest date, Applicants believe that **Peng** is a published document on 27 May 2004, it should not issue to patent in light of US Patent 6,020,457.

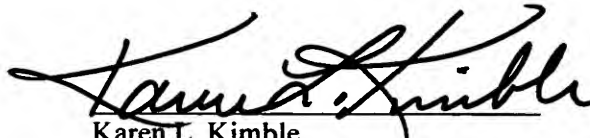
The PCT Application at page 7, last sentence on the amended page, states that the phosphine entities may not quench the photoluminescence that is essential for bio labeling. This desired result is achieved and shown by Fig. 17 where (iii) is about 50% with sulfur and (i) and (ii) are 0% with phosphine dendrons of PAMAM and polyether types. These two illustrated dendrimer types show two different dendrimer structures for phosphine entities that both are effective. Thus it is reasonably expected that other dendrimers of phosphines would also be effective. Fig. 17 illustrates Example 21 on page 20 of the PCT application. The importance of this non-quenching feature is discussed further on page 20, lines 14-15. In a later publication by the inventors [*Inorganica Chimica Acta* accepted 20 Nov 2005 and available on line at www.sciencedirect.com; copy enclosed] single site phosphine dendrimer entities are further discussed and shows that many phosphine dendrimer types will be useful and non-quenching. Peng has no teaching of this distinguishing feature that is important for this use or that the phosphine entities has he generally taught would display such results compared with sulfur analogues. Clearly the entities now claimed were not specifically taught for these structures or this use. Applicants believe that this non-quenching effect of phosphine dendrimer entities could not have been predicted and that inventive step over all cited references has been shown. Applicants earlier remarks with regard to other citations can be found with the Response dated 23 May 2005.

CONCLUSIONS

Applicants believe that they have overcome all cited references and respectfully request the allowance of all amended claims from 23 May 2005.

If the Examiner has any questions concerning this Preliminary Amendment, please contact the undersigned. If there are still unresolved issues, Applicants respectfully request that the Examiner contact the undersigned to expedite allowance of the claims.

Respectfully submitted,



Karen L. Kimble
Registration No. 26,995
Phone: (989) 687-7401
Fax: (989) 687-7403
Email: techlaw@tm.net

3595 N. Sunset Way
Sanford, MI 48657

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Tomalia and Huang, *Inorganica Chimica Acta* accepted 20 Nov 2005 and
available on line at www.sciencedirect.com

TO WHOM IT MAY CONCERN:

IAP20 Rec'd PCT/US 20 JAN 2006

We, Donald A. Tomalia, a resident of the City of Midland, County of
Midland, State of Michigan, a citizen of the United States of America and Baohua
Huang, a resident of the City of Mount Pleasant, County of Isabella, State of
5 Michigan, a citizen of the People's Republic of China, have discovered new and novel

**STABILIZED AND CHEMICALLY
FUNCTIONALIZED NANOPARTICLES**

10 of which the following is a specification.

This application claims priority from United States Provisional Application
60/488,909, filed on July 21, 2003 and International Application
PCT/US2004/023483, filed 21 July 2004, from which this application is the national
phase application.

15 The design of nanoscale molecular architecture, using the convergent
polymerization technique, or "the bottom up approach" has offered a wide range of
possibilities for creating new optoelectronic materials. Such an approach requires
systematic and rigorous control over size, shape, and surface chemistry in order to
capture critical nano-properties anticipated from these important targets. Dendrons
20 and dendrimers are precise quantized, three-dimensional nanostructures that offer
such control and are of keen interest to both nano-scientists as building blocks and to
polymer scientists due to their unique, architecturally driven, macromolecular
properties. Architecturally, dendrons and dendrimers are core-shell nanostructures
consisting of (a) core, (b) interior branch cells and (c) an exponential number of
25 functionalized surface groups (Z), that amplify as a function of the expression:
 $Z = N_c N_b^G$; where G=generation and N_c , N_b are core and branch cell multiplicities,
respectively. All of the above parameters may be combinatorially tuned to fit many
important biomedical and optoelectronic applications. Dendronization is a widely
accepted term that describes either the covalent or supramolecular attachment of
30 dendrons to non-dendritic properties. By definition, a dendron has a core multiplicity
(N_c) of one, therefore amplification of surface (terminal)